

CLAIM AMENDMENTS

1. (canceled)

1 2. (previously presented) The method according claim 20
2 wherein a target with a doping content of less than 1.5 at-% is
3 used.

1 3. (previously presented) The method according to claim
2 20 wherein a target with aluminum as the doping agent is used.

1 4. (previously presented) The method according to claim
2 20 wherein the substrate is heated to above 250 °C.

1 5. (previously presented) The method according to claim
2 20 wherein a dynamic deposition rate of greater than 80 nm*m/min is
3 set that corresponds to a static deposition rate of greater than
4 300 nm/min.

1 6. (previously presented) The method according to claim
2 20 wherein a dual magnetron arrangement with medium frequency
3 excitation is used.

1 7. (previously presented) The method according to claim
2 20 wherein a dynamic flow process is carried out in which the
3 substrate is moved during sputtering.

1 8. (currently amended; withdrawn) A conductive and
2 transparent zinc oxide layer, produced with the method according to
3 claim 20, wherein the content of doping agent, in the produced
4 oxide layer is less than 3.5 at-%, the resistivity is less than
5 1×10^{-3} W cm, the charge carrier mobility is greater than 25 cm²/V s,
6 and the averaged transmittance of 400 to 1100 nm is greater than
7 80%.

1 9. (withdrawn) The oxide layer according to claim 8
2 wherein the content of doping agent is less than 3 at-%,
3 particularly less than 2.5 at-%.

1 10. (withdrawn) The oxide layer according to claim 8
2 wherein the resistivity is less than 5×10^{-2} W cm.

1 11. (withdrawn) The oxide layer according to claim 8
2 wherein the charge carrier mobility is greater than 35 cm²/V s.

1 12. (withdrawn) The oxide layer according to claim 8
2 wherein the averaged transmittance of 400 to 1100 nm is greater
3 than 82%.

1 13. (withdrawn) The oxide layer according to claim 8
2 wherein the layer comprises aluminum as the doping agent.

1 14. (withdrawn) Use of an oxide layer according to
2 claim 8 in a solar cell.

1 15. (withdrawn) The use according to claim 14 in a
2 crystalline silicon thin-film solar array.

1 16. (withdrawn) The use according to claim 14 in an
2 amorphous and crystalline silicon tandem solar array.

1 17. (previously presented) The method according claim
2 20 wherein a target with a doping content of less than 1 at-% is
3 used.

1 18. (previously presented) The method according to
2 claim 20 wherein the substrate is heated to temperatures above
3 300 °C.

1 19. (previously presented) The method according to
2 claim 20 wherein a dynamic deposition rate of greater than 100
3 nm*m/min is set that corresponds to a static deposition rate of
4 greater than 380 nm/min.

1 20. (currently amended) A method of making a conductive
2 and transparent zinc-oxide layer on a substrate by reactive
3 sputtering, the sputtering process including a hysteresis region, a
4 heater for heating the substrate to more than 200 °C, and a dynamic
5 deposition rate of greater than 50 nm*m/min that corresponds to a
6 static deposition rate of more than 190 nm/min, the method
7 comprising the steps of:

8 using a metallic Zn target with a doping content of less
9 than 2.3 at-%;

10 controlling subsequent etching behavior and resulting
11 surface roughness of the zinc-oxide layer by selecting a stabilized
12 operating point within the unstable process region that is located
13 between a transition point between a stable metal process and an
14 unstable process and an inflection point of the stabilized process
15 curve; and

16 post-treating the zinc-oxide layer by wet-chemical or dry
17 etching to develop a root-mean-square roughness of 30 to 300nm.